



ABSTRACT

Cost-effective processes for producing lactic acid and/or lactate from pentose-containing substrates, such as xylose-containing substrates, are provided. In particular, processes for producing lactic acid and/or lactate include fermentation of pentoses, such as xyloses, to enantiomerically pure lactic acid and/or lactate by moderately thermophilic *Bacillus* species. This fermentation runs by a homofermentive pathway and produces predominantly C₃ compounds, so that C₃ compounds can be recovered as lactic acid and/or lactate.